We Claim:

1. A method of amplification of target polynucleotide molecule potentially contained in a sample with non-target polynucleotides comprising the steps of:

a. contacting the sample potentially containing the target with a first support capable of specifically associating with the target under binding conditions.

b. separating said first support from the remaining sample to form a removal product which in the presence of target includes target;

c. subjecting said removal product to amplification which in the presence of target forms an amplification product.

2. The method of Claim 1 wherein said method further includes the step of determining the presence of said amplification product.

3. The method of Claim 2 wherein said step of determining the presence of said amplification product includes contacting said amplification product with a probe having a label moiety.

4. The method of Claim 1 wherein said method further includes the step of contacting said amplification product with a second support capable of specifically associating with said amplification product under binding conditions.

5. The method of Claim 1 wherein said first support includes a retreivable support.

6. The method of Claim 5 wherein said first support is capable of associating with the target through a probe.

7. The method of claim 6 wherein said probe includes a ligand capable of binding to an antiligand associated with said first support.

8. The method of Claim 6 wherein said probe is coated with recA protein.

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9. The method of claim 1 wherein said amplifying step comprises treating said target with a polymerase.

10. The method of claim 9 wherein said polymerase is RNA polymerase, Qβ replicase, transcriptase or DNA polymerase.

11. The method of claim 9 wherein said target is DNA and, prior to said step of treating said target with said polymerase, said target is caused to replicate by subjecting said target to DNA polymerase and non-specific oligonucleoide primer.

12. The method of Claim 1 wherein said target is mRNA.

13. A method of amplifying target polynucleotide molecules potentially contained in a sample with non-target polynucleotides, said method comprising:

a) contacting said sample with a first polynucleotide probe under binding conditions, said first probe capable of specifically associating with said target under binding conditions to form a first probe-target complex;

b) substantially separating said first probe from said non-target polynucleotides in said sample to form a removal product which in the presence of target includes the first probe-target complex;

c) subjecting said removal product to amplification to form an amplification product the generation of which is dependent on the presence of target.

14. The method of claim 13 wherein said amplification product is detectable with a labeled probe.

15. The method of claim 13 further comprising the step subjecting said removal product and said amplification product, if present, to contact with a second probe under binding conditions said second probe capable of specifically associating with said amplification product to form a second probe-amplification product complex, said second probe capable of associating or in associa-

tion with a support to capture said amplification product for further processing.

16. The method of claim 15 wherein said further processing includes the steps of contacting said removal product and said amplification product, if present, with a label probe under binding conditions, said label probe capable of specific association with said amplification product under binding conditions, monitoring said amplification product for the presence of the label probe indicating the presence of the target molecule.

17. The method of claim 13 wherein said amplification comprises contacting said removal product with polymerase.

18. The method of claim 17 wherein said polymerase is RNA polymerase, Qβ polymerase, reverse transcriptase or DNA polymerase.

19. The method of claim 17 wherein said target polynucleotide is DNA and, prior to said step of treating said removal product with said polymerase, said target DNA is caused to replicate by subjecting said removal product to the enzyme DNA polymerase and non-specific oligonucleotide primer.

20. The method of claim 13 wherein said target polynucleotide is mRNA.

21. A kit for capturing and amplifying a target polynucleotide contained in a sample medium potentially containing the target with non-target polynucleotides comprising:

a) a first probe capable of binding to a retrievable support and said target under binding conditions;

b) a retrievable support capable of forming a substantially homogeneous dispersion within a sample medium and capable of separation therefrom to form a removal product which in the presence of target in the sample includes said target; and

c) amplification reagents adapted to be applied to said removal product.

22. The method of claim 21 wherein said retrievable support includes at least one bead.

23. The method of claim 22 wherein said bead is capable of interacting with a magnetic field.

24. An instrument for performing assays for target polynucleotides comprising :

a reaction chamber adapted for receiving target polynucleotides and non-target polynucleotides in a sample medium and a support capable of a substantially homogeneous dispersion within the sample medium and capable of forming a complex with the target;

means for separating the support from the sample medium to form a removal product, which in the presence of target in the medium includes target, which removal product is substantially free of non-target polynucleotides;

means to amplify said target as part of a removal product to form an amplification product; and

means to detect said amplification product.

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